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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,666	03/27/2001	H. Jim Fulford	2000.045900/TDM	2445

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EXAMINER	
TRAN, BINH X	

ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/818,666	FULFORD ET AL.	
	Examiner	Art Unit	
	Binh X Tran	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *33-40* is/are withdrawn from consideration.

5)☒ Claim(s) *1-12* is/are allowed.

6)☒ Claim(s) *13-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7-25-2003 has been entered. The applicants' claims submitted on 7-25-2003 contain an inadvertently error as discussed in previous office action. The applicants corrected the inadvertently error by submitting a new amendment on 8-29-2003. This office action is responsive to amendment submitted on 8-29-2003.

Election/Restrictions

2. Newly submitted claims 36-40 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The examiner previously requested an election/restrictions requirement between the process claims and apparatus claims. Applicants already elected to prosecute the process claims in previous office actions.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 36-40 are withdrawn from consideration

as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 13-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bukhman et al. (US 5,795,493) in view of Bollinger (US 5,375,064).

Respect to claim 13, 23 Bukhman teaches a method comprising:

forming a process layer above a semiconductor substrate;

etching at least a portion of the process layer (col. 6 lines 40-67, col. 8 lines 34-38);

measuring the initial thickness at plurality portions of wafer surface and measuring a subsequent thickness of the device wafer at a plurality of location (col. 8 lines 30-44, read on measuring a depth of the etch at a plurality of locations in a first preselected and measuring a depth etch at a plurality of locations in a second preselected region);

heating the plurality of portions to a temperature determined by heating profile map and repeating the etching, heating step until the wafer has a predetermined thickness (Note: the term "predetermined thickness" is the same with "desired depth" col. 8 lines 40-50, read on varying the temperature of a subsequently processed semiconducting substrate in a region corresponding to the first and/or second preselected region is not etched to the first and/or second desired depth).

Bukhman does not explicitly disclose the step of determining if at least a portion of the first and/or second preselected region is etched to a first and/or second desired depth. In a semiconductor method, Bollinger discloses step (34) to determine if the measured thickness profile (i.e. measure depth of the first preselected region and second preselected region) is etched to a predetermined or desired thickness (i.e. desired depth) (col. 4 lines 45-60, Fig 3). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Bukhman in view of Bollinger by comparing the first depth to a desired depth because it help us to determine whether we should stop or continue with the etching process.

Respect to claims 14-15, 24-25 Bukhman teaches an increase in temperature results in proportional increase in etch rate (col. 4 lines 48-55). The examiner will

interpret that Bukhman also implicitly teaches that a decrease in temperature result in proportional decreases in etch rate. Therefore, it would be obvious to one skill in the art to increase (or raise) the temperature of the subsequently process if the first and/or second measured depth is less than the first and/or second desired depth. It is also equally obvious to one skill in the art to decrease the temperature of the subsequently process if the first and/or second measured depth is greater than the first and/or second desired depth.

Respect to claims 16 and 26, Bukhman teaches that the process layer is a polysilicon above the semiconductor substrate (col. 2 lines 42-50). Respect to claims 17 and 27, Bukhman teaches performing a plasma etching process on the layer (col. 3 lines 24-52). Respect to claims 18 and 28 the step of varying the temperature of the subsequently process has been discussed in previous paragraphs.

Respect to claim 19-22, 29-32, Bukhman teaches to measure the depth of a plurality of locations (col. 8 lines 26-50). It is known both in math and statistics that the average (aka mean), the median, the minimum (aka smallest), the maximum (aka greatest) must exist and can be calculated if a plurality of data point is known (i.e., the plurality of measured depths is known). It would have been obvious to one having ordinary skill in the art, at the time of invention, to use the average, the medium, the minimum or the maximum as the first depth because it can be easily calculated and it is a representation of data points.

Allowable Subject Matter

6. Claims 1-12 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter: The cited prior arts fail to disclose or suggest each of the plurality of the preselected regions of the semiconducting substrate has an associated temperature adjusting element and providing an indication to the temperature adjusting element associated with the first preselected region to adjust the temperature in response to the first depth being different from the desired depth.

Response to Arguments

8. Applicant's arguments filed 8-29-2003 with respect to claims 13-32 have been fully considered but they are not persuasive. The applicants argue that "the motivation to modify Bukhman as alleged by the examiner is solely based upon the Applicants' own disclosure. It is respectfully submitted that such impermissible hindsight relied upon by the examiner does not provide a proper basis for such alleged obviousness". In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, Bollinger clearly teaches that step of comparing the measured profiled depth to the desired depth is necessary in order to help us to determine whether we should stop or continue with the etching process (Fig 3). Without the comparing step, it is very hard to

determine when to stop the etching so that the etching profiled match the desired profile.

The applicants further argue that the examiner's assertion that "the average, the median, the minimum, the maximum must exist and can be calculated if a plurality of data point is known" based on examiner's personal knowledge and without proper reference. The examiner provides a prior art of record in the office action to support the above assertion.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Math Glossary of Terms, Wisconsin Model Academics Standards, http://www.dpi.state.wi.us/dpi/standards/mathglos.html provides the definition and how to calculate max, min, mean, median.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran

NADINE G. NORTON
PRIMARY EXAMINER